AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) An apparatus for measuring the wavelength of an input light beam, the apparatus comprising:

an optical waveguide having an input port and two output ports, the optical waveguide defining first and second optical paths which operate to direct light from the input port to the first and second output ports, respectively, and which have physical path lengths which differ by a preset amount to yield a first optical length difference therebetween, wherein the two output ports are located in a common plane normal to the direction of propagation of the central light rays emitted therefrom and are separated by a separation distance such that light exiting the optical waveguide through the two output ports forms, at an observation plane disposed at a second distance from the two output ports, a fringe pattern whose configuration at the observation plane is a function of the wavelength of the input light beam;

a photo detector adapted to generate one or more detection signals in response to said fringe pattern; and

a processor ~~implementing a process for analyzing said one or more detection signals to thereby determine the wavelength of the input light beam~~ <u>responsive to said detection signals and operative:</u>

<u>to determine an average period of the fringes evidenced by said detection signals and the phase of a selected fringe evidenced by the detection signals;</u>

<u>to determine an exact order number of the light to a reference point on said photo detector based on the average period and phase;</u>

<u>to determine an optical delay of said first optical length difference at said reference point; and</u>

to divide said optical delay by said exact order number to get the wavelength of the input light beam.

2 - 4. (Canceled)

5. (Previously Presented) The apparatus of claim 1, wherein the optical waveguide comprises an integrated optical circuit including waveguide beam splitter, optical phase delay, and output ports.

6. (Previously Presented) The apparatus of claim 1, further comprising a heat sink in thermal communication with optical waveguide.

7. (Previously Presented) The apparatus of claim 6, wherein the temperature of the optical waveguide is actively and/or passively regulated through the heat sink.

8. (Currently Amended) The apparatus of claim 1, further comprising a temperature sensor generating temperature signals indicative of the temperature of the optical waveguide, said ~~process for analyzing said one or more detection signals including determining~~ processor being operative to determine an optical delay in the first and second optical paths ~~in the planar wave guide beam splitter~~ as a function of said temperature signals.

9. (Original) The apparatus of claim 5, wherein the integrated optical circuit comprises SiO_2 on a silicon substrate.

10. (Original) The apparatus of claim 1, wherein the first optical length difference is a physical length difference of about 2.33 mm.

11. (Original) The apparatus of claim 1, wherein the separation distance of the two output ports is about 250 μm.

12. (Original) The apparatus of claim 1, wherein the second distance is about 63.5 mm.

13. (Original) The apparatus of claim 1, wherein the discrete light sensing elements of the photo detector are spaced about 25 μm center-to-center.

14. (Original) The apparatus of claim 1, wherein the photo detector responds to light of wavelengths in the range of from about 0.8 μm to about 1.7 μm.

15. (Original) The apparatus of claim 1, wherein the photo detector responds to light of wavelengths in the range of from about 0.4 μm to about 1.1 μm.

16. (Previously Presented) The apparatus of claim 1, wherein the optical waveguide comprises an input port, a fiber optic beam splitter, and two optic fibers respectively interposed between said beam splitter and output ports.

17. (Currently Amended) The apparatus of claim 1, wherein the ~~process for analyzing said one or more detection signals including determining~~ processor is operative to determine a phase difference between two points in the fringe pattern from said detection signals.

18. (Currently Amended) The apparatus of claim 17, wherein the ~~process for analyzing said one or more detection signals including determining~~ processor is operative to determine the average phase at the two points from said detection signals.

19. (Currently Amended) The apparatus of claim 1, wherein the ~~process for analyzing said one or more detection signals including determining~~ processor is operative to determine the average phase at two points in the fringe pattern from the detection signals.

20. (Previously Presented) An apparatus for measuring the wavelength of an input light beam, the apparatus comprising:

an optical device having an input port and two output ports, the optical device defining first and second optical paths which operate to direct light from the input port to the first and second output ports, respectively, and which have optical lengths which differ by a first optical length difference, wherein the two output ports are separated by a separation distance such that light exiting the optical device through the two output ports forms, at an observation plane disposed at a second distance from the two output ports, a fringe pattern whose configuration at the observation plane is a function of the wavelength of the input light beam;

a photo detector adapted to generate one or more detection signals in response to said fringe pattern;

a processor implementing a process for analyzing said one or more detection signals to thereby determine the wavelength of the input light beam; and

one or more arrays of optical fibers having input ends configured to receive the fringe pattern.

21. (Original) The apparatus of claim 20, wherein the number of arrays is two, and wherein the input ends of the fibers of each array are separated by 1/4 fringe distance.

22. (Original) The apparatus of claim 20, wherein the separation of the output ports is about 150 μm.

23. (Original) The apparatus of claim 20, wherein the second distance is about 96.8 mm.

24. (Currently Amended) A method for measuring the wavelength of an input light beam <u>by use of a wavemeter</u>, the method comprising:

launching the input light beam into a waveguide <u>of the wavemeter</u>;

splitting the input light beam in the waveguide into two light beams;

directing the two light beams through two waveguide paths of different optical length and having two exit ports that are located in a plane normal to the direction of propagation of the central light rays exiting from said exit ports, said two waveguide paths having physical path lengths which differ by a preset amount to yield an optical path length difference therebetween;

interfering light exiting said two paths to thereby form a fringe pattern at an observation plane;

detecting the fringe pattern; [[and]]

determining, by use of a processor of the wavemeter, an average period of fringes and the phase of a selected fringe of the detected fringe pattern;

analyzing the ~~configuration of said detected fringe pattern~~ average period and phase to thereby determine the wavelength of the input light beam; and

causing the wavemeter to provide information of the determined wavelength to a user.

25 - 27 (Canceled)

28. (Original) The method of Claim 24, wherein said analyzing comprises: determining a phase difference between two points in the fringe pattern.

29. (Original) The method of Claim 28, wherein said analyzing comprises: determining the average phase at the two points.

30. (Original) The method of Claim 24, wherein said analyzing comprises: determining the average phase at two points in the fringe pattern.

31. (Original) The method of claim 24, further comprising:
actively and/or passively regulating the temperature of the two paths.

32. (Original) The method of claim 24, further comprising:
generating temperature signals indicative of the temperature in the two paths; and

determining an optical delay in the two paths as a function of said temperature signals.

33. (Original) The method of claim 24, wherein the waveguide is an optical fiber.

34. (Original) The method of claim 24, wherein said input light beam is split by means of an integrated optical circuit.

35. (Currently Amended) An apparatus for measuring the wavelength of an input light beam, the apparatus comprising:

means for splitting the input light beam into two light beams;

means for directing the two light beams through two waveguide paths of different optical length and having two exit ports that are located in a plane normal to the direction of propagation of the central light rays exiting from said exit ports, said two waveguide paths having physical path lengths which differ by a preset amount to yield an optical path length difference therebetween;

means for causing light exiting the two paths to interfere such that a fringe pattern is formed at an observation plane;

means for detecting the fringe pattern; and

means for ~~analyzing the configuration of said detected fringe pattern~~ determining an average period of fringes of the fringe pattern and the phase of a selected fringe of the fringe pattern and for calculating the wavelength of the input light beam based on the average period of the fringes and phase.

36 - 38. (Canceled)

39. (Currently Amended) The apparatus of Claim 35, wherein said means for ~~analyzing~~ determining an average period determines a phase difference between two points in the fringe pattern.

40. (Currently Amended) The apparatus of Claim 39, wherein said means for ~~analyzing~~ determining an average period determines the average phase at the two points.

41. (Currently Amended) The apparatus of Claim 35, wherein said means for ~~analyzing~~ determining an average period determines the average phase at two points in the fringe pattern.

42. (Original) The apparatus of claim 35, further comprising:

means for actively and/or passively regulating the temperature of the two paths.

43. (Currently Amended) The apparatus of claim 35, further comprising:

means for generating temperature signals indicative of the temperature in the two paths, said means for ~~analyzing operating~~ determining an average period being operative to determine an optical delay in the two paths as a function of said temperature signals.

44. (Currently Amended) An apparatus for measuring the wavelength of an input light beam, the apparatus comprising:

an optical device having an input port and two output ports, the optical device defining first and second optical paths which operate to direct light from the input port to the first and second output ports, respectively, and which have physical path lengths which differ by a preset amount to yield a first optical length difference therebetween, wherein the two output ports are in a common plane normal to the direction of propagation of the central light rays emitted therefrom, and are separated by a separation distance such that light exiting the optical device through the two output ports forms, at an observation plane disposed at a second distance from the two output ports, a fringe pattern whose configuration at the observation plane is a function of the wavelength of the input light beam;

a photo detector adapted to generate one or more detection signals in response to said fringe pattern; and

a processor implementing a process for analyzing the one or more detection signals to thereby determine the wavelength of the input light beam, said process including:

determining the average spacing between fringes and computing therefrom [[the]] a preliminary wavelength of ~~said incident radiation~~ the light;

determining the phase and computing the exact order number of the light to a reference point on said photo detector based on the phase;

determining [[the]] an optical delay of said first optical length difference at said reference point on said photo detector; and

computing from said exact order number and said ~~high accuracy~~ optical delay the wavelength of said input light beam.

45. (Original) The apparatus of claim 44, wherein the optical device comprises an integrated optical circuit.

46. (Original) The apparatus of claim 44, further comprising a heat sink in thermal communication with the optical device.

47. (Original) The apparatus of claim 46, wherein the temperature of the optical device is actively and/or passively regulated through the heat sink.

48. (Currently Amended) The apparatus of claim 44, further comprising a temperature sensor generating temperature signals indicative of the temperature of the optical device, said process for analyzing the one or more detection signals further including determining an optical delay in the first and second optical paths ~~in the planar wave guide beam splitter~~ as a function of said temperature signals.

49. (Original) The apparatus of claim 45, wherein the integrated optical circuit comprises SiO_2 on a silicon substrate.

50. (Original) The apparatus of claim 44, wherein the first optical length difference is a physical length difference of about 2.33 mm.

51. (Original) The apparatus of claim 44, wherein the separation distance of the two output ports is about 250 μm.

52. (Currently Amended) The apparatus of claim [[4]] <u>44</u>, wherein the second distance is about 63.5 mm.

53. (Original) The apparatus of claim 44, wherein the discrete light sensing elements of the photo detector are spaced about 25 μm center-to-center.

54. (Original) The apparatus of claim 44, wherein the photo detector responds to light of wavelengths in the range of from about 0.8 μm to about 1.7 μm.

55. (Previously Presented) The apparatus of claim 44, wherein the photo detector responds to light of wavelengths in the range of from about 0.4 μm to about 1.1 μm.

56. (Original) The apparatus of claim 44, wherein the optical device comprises a fiber optic coupler whose output fibers provide the required optical phase delay.

57. (Original) The apparatus of claim 56, wherein the first optical length difference is a physical length difference of about 2.33 mm.

58. (Original) The apparatus of claim 56, wherein the separation distance of the two output ports is about 250 μm.

59. (Currently Amended) An apparatus for measuring the wavelength of an input light beam, the apparatus comprising:

an optical device having an input port and two output ports, the optical device defining first and second optical paths which operate to direct light from the input port to the first and second output ports, respectively, and which have optical lengths which differ by a first optical length difference, wherein the two output ports are separated by a separation distance such that light exiting the optical device through

the two output ports forms, at an observation plane disposed at a second distance from the two output ports, a fringe pattern whose configuration at the observation plane is a function of the wavelength of the input light beam;

a photo detector adapted to generate one or more detection signals in response to said fringe pattern;

a processor implementing a process for analyzing the one or more detection signals to thereby determine the wavelength of the input light beam, said process including:

determining the average spacing between fringes and computing therefrom the wavelength of said incident radiation;

determining the exact order number of the light to a reference point on said photo detector;

determining the optical delay at said reference point on said photo detector; and

computing from said exact order number and said ~~high-accuracy~~ optical delay the wavelength of said input light beam; and

one or more arrays of optical fibers having input ends configured to receive the fringe pattern.

60. (Original) The apparatus of claim 59, wherein the number of arrays is two, and wherein the input ends of the fibers of each array are separated by 1/4 fringe distance.

61. (Previously Presented) The apparatus of claim 1, wherein the preset amount is at least 1 mm.

62. (Currently Amended) The ~~apparatus~~ <u>method</u> of claim 24, wherein the preset amount is at least 1 mm.

63. (Previously Presented) The apparatus of claim 35, wherein the preset amount is at least 1 mm.

64. (Previously Presented) The apparatus of claim 44, wherein the preset amount is at least 1 mm.